

"Chignecto," in N. 42° 30', W. 50° 15', passed a large iceberg. 28th—S. S. "Caspian," in 43° 00', W. 50° 00', passed two icebergs.

31st.—S. S. "City of Rome," in N. 43° 14', W. 49° 35', passed an iceberg; s. s. "Norwegian" sighted several icebergs between Cape Pine and Saint John's harbor.

#### SIGNAL SERVICE AGENCIES.

Signal Service agencies have been established in the Maritime Exchange buildings at New York and Philadelphia, and in the Custom House, Boston, where the necessary blanks and other information will be furnished to shipmasters. In January REVIEW was published an explanation of the object of these agencies.

In pursuance of the arrangements made with the Meteorological Office of London, England, there were, during March, 1885, twelve reports cabled to that office from New York, concerning storm and icebergs encountered by vessels in the Atlantic west of the forty-fifth meridian. Four messages were sent from Boston.

#### TEMPERATURE OF THE AIR.

[Expressed in degrees, Fahrenheit.]

The distribution of mean temperature over the United States and Canada for March, 1885, is exhibited on chart ii. by the dotted isothermal lines; and in the table of miscellaneous data are given the means for the various stations of the Signal Service.

In the following table are given the mean temperatures for the several geographical districts with the normals and departures, as deduced from the Signal Service observations:

*Average temperatures for March, 1885.*

Districts.	Average for Mar. Signal-Service observations.		Comparison of Mar., 1885, with the average for several years.
	For several years.	For 1885.	
	°	°	°
New England.....	33.6	26.8	- 6.8
Middle Atlantic states.....	41.0	33.6	- 7.4
South Atlantic states.....	54.6	48.4	- 6.2
Florida peninsula.....	67.0	62.4	- 4.6
Eastern Gulf states.....	58.2	52.2	- 6.0
Western Gulf states.....	59.9	55.7	- 4.2
Rio Grande valley.....	70.0	66.4	- 3.6
Tennessee.....	50.3	41.4	- 8.9
Ohio valley.....	42.2	34.3	- 7.9
Lower lake region.....	33.5	23.0	- 10.5
Upper lake region.....	20.5	17.0	- 3.5
Extreme northwest.....	20.3	21.9	+ 1.6
Upper Mississippi valley.....	36.8	34.3	- 2.5
Missouri valley.....	31.8	34.4	+ 2.6
Northern slope.....	32.0	35.1	+ 3.1
Middle slope.....	40.8	40.4	- 0.4
Southern slope.....	55.8	51.5	- 4.3
Southern plateau.....	52.0	54.0	+ 2.0
Middle plateau.....	40.4	45.0	+ 4.6
Northern plateau.....	49.9	47.0	- 2.9
North Pacific coast region.....	46.0	49.9	+ 3.9
Middle Pacific coast region.....	54.0	55.9	+ 1.9
South Pacific coast region.....	58.5	62.6	+ 4.1
Mount Washington, N. H.....	11.1	2.1	- 9.0
Pike's Peak, Colo.....	7.8	9.3	+ 1.5

In the extreme northwest, upper Missouri valley, Rocky mountain region, and on the Pacific coast, the mean temperatures for March, 1885, were above the normal, while in all districts to the eastward they were below the normal. The greatest departures below the normal occurred in the lake region and Ohio valley, where, at numerous stations, the departures exceeded 10°. In the Gulf states and in the districts along the Atlantic coast, the departures, though less marked, were decidedly below the normal. In the districts where the month has been warmer than the average the departures above the normal temperature have been greatest in the northern slope and northern plateau, where they averaged 6°.1; in the middle plateau and on the Pacific coast the departures averaged about 4°.

#### RANGES OF TEMPERATURE.

The monthly and daily ranges of temperature at the various Signal Service stations are given in the table of miscellaneous

meteorological data. They varied from 24° at Key West, Florida, and 24°.5 at Tatoosh Island, Washington Territory, to 73° at Escanaba, Michigan, and 76° on the summit of Mount Washington, New Hampshire. In all districts east of the Rocky mountains, except along the Gulf coast and on the Atlantic coast south of Massachusetts, the monthly ranges of temperature exceeded 50°.

#### DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of average temperatures for the various districts, also in the table of miscellaneous data and on chart iv. The following notes in connection with this subject are reported by voluntary observers:

*Arkansas.*—Lead Hill, Boone county: mean temperature, 45°.5, is 4°.4 below the March average for the three preceding years.

*California.*—Hydesville, Humboldt county: mean temperature, 51°.7, is above the average for March; it is 3°.2 above that for March, 1884.

*Connecticut.*—Hartford: mean temperature, 26°.7, is 7°.7 below that for March, 1884.

*Norfolk.*—mean temperature, 19°.7, is the lowest recorded in March during the last forty years.

*Dakota.*—Webster, Day county: mean temperature, 27°.6, is 5°.4 above the March average for the two preceding years.

*Georgia.*—Milledgeville: the month was the coldest March for many years; the mean temperature, 49°.8, is 7°.4 below that for March, 1884.

*Illinois.*—Mattoon, Coles county: mean temperature, 34°.5, is 3°.7 below the March average for the last five years.

*Anna, Union county:* mean temperature, 40°.7, is 5°.7 below the March average for the last ten years.

*Swanwick, Perry county:* mean temperature, 38°.2, is 5°.4 below the March average for the last three years.

*Riley, McHenry county:* mean temperature, 24°.8, is 5°.3 below the March average for the last twenty-four years. The mean temperature for the first twenty-three days was lower than for any corresponding period previously recorded.

*Peoria, Peoria county:* mean temperature, 31°.1, is 4°.6 below the March average for the last thirty years.

*Sycamore, Dekalb county:* mean temperature, 25°.7, is 6°.8 below the March average for the three preceding years.

*Indiana.*—Logansport, Cass county: mean temperature, 29°.6, is 10°.7 below the March average for a period of twenty-six years.

*Vevay, Switzerland county:* mean temperature, 35°.7, is 7°.1 below the March average for the last twenty-one years. The minimum temperature on the 23d, 8°, is the lowest that has occurred at so late a date during the above period.

*Spiceland, Henry, county:* mean temperature, 30°.1, is 6°.3 below the March average for a period of thirty years.

*Kansas.*—Independence, Montgomery county: mean temperature, 43°.1, is 2° below the March average for the last four-teen years.

*Wellington, Sumner county:* mean temperature, 41°.6, is 1°.6 below the March average for the last seven years.

*Lawrence, Douglas county:* mean temperature, 40°.6, is 1°.2 below the March average for the last seventeen years.

*Yates Centre, Woodson county:* mean temperature, 40°.4, is slightly below the March average for the last five years.

*Maine.*—Gardiner, Kennebec county: mean temperature, 20°.8, is 8°.7 below the March average for the last forty-nine years, and is the lowest recorded during that period, the next lowest being 22°.0 for March, 1872.

*Maryland.*—Fallston, Harford county: mean temperature, 30°.6, is the lowest recorded in March during the last fourteen years, and is 8°.1 below the average for the same period; it is but a small fraction of a degree above the mean temperature for January for a period of fifteen years.

*Massachusetts.*—Somerset, Bristol county: mean temperature, 28°.2, is 6°.2 below the March average.

Worcester, Worcester county: mean temperature, 23°·5, is the lowest recorded in March for forty-seven years, and is 9°·8 below the average for the same period.

Michigan.—Thornville, Lapeer county: mean temperature, 21°, is about 10° below the normal for March.

Nevada.—Carson City: mean temperature, 47°·2, is 8°·3 above the March average.

New Hampshire.—Contocook, Merrimack county: mean temperature, 23°·7, is about 7°·5 below the March average.

New Jersey.—Moorestown, Burlington county: mean tem-

perature, 29°·7, is 8°·5 below the January average for a period of twenty-two years, and is 1°·7 lower than that for March, 1872, which was the lowest previously recorded.

South Orange, Essex county: mean temperature, 28°·9, is 7° below the March average for fifteen years; it is but 0°·1 above that for March, 1872—the lowest recorded during the above period.

New York.—North Volney, Oswego county: mean temperature, 18°·6, is the lowest recorded for March during the last eighteen years, and is 9°·3 below the average for the same period.

Table of comparative minimum temperatures for the month of March.

State or Territory.	Minimum for March, 1885, Signal Service.		Minimum since Signal-Service stations were opened—3 to 14 years.			Lowest from any other source.			
	Station.	Temperature.	Station.	Temperature.	Year.	Place.	Temperature.	Year.	Length of record.
Alabama	Montgomery	0	Montgomery	0		Huntsville	0		Years.
Do	Mobile	26·2	Mobile	25	1873	Mobile	11		9
Arizona	Prescott	29·0	Prescott	31	1876	Fort Canby (old)	31		33
Do	Fort Apache	26·8	Fort Apache	8	1876	Fort Apache	1		12
Arkansas	Fort Smith	22·0	Fort Smith	11	1881	Fort Smith	5	1875	8
Do	Little Rock	24·3	Little Rock	23·5	1884	Little Rock	3		22
California	Sacramento	27·1	Sacramento	28	1884	Camp Bidwell	0		28
Do	San Francisco	45·8	San Francisco	39	1886	Presidio	35		19
Colorado	Pike's Peak	49·5	Pike's Peak	29	1886	Fort Garland	1		27
Do	Denver	12·0	Denver	10	1875	Fort Lyon	7		22
Connecticut	New London	6·3	New London	4	1884	Colerbrook	10		23
Do	New Haven	0·2	New Haven	0·8	1884	New Haven	9		12
Dakota	Fort Buford	2·7	Fort Buford	23	1886	Fort Buford	40	1867	86
Do	Yankton	2·4	Yankton	10	1876, 1886	Fort Abercrombie	40	1861, 1869?	14
Delaware	Delaware Breakwater	15·3	Delaware Breakwater	15·3	1884	Fort Delaware	5		45
District of Columbia	Washington City	10·3	Washington City	4	1873	Washington City	5		49
Florida	Pensacola	31·2	Pensacola	36	1881	Fort Barrancas	28		59
Do	Key West	60·9	Key West	53	1873	Key West	49		44
Georgia	Savannah	33·3	Savannah	27	1873	Savannah	27		37
Do	Augusta	26·4	Augusta	22	1873	Augusta Arsenal	15		49
Idaho	Boise City	27·7	Boise City	9	1882	Fort Hall	1		5
Do	Lewiston	29·6	Lewiston	12	1880	Fort Lapwai	1		19
Illinois	Chicago	4·4	Chicago	0·9	1884	Chicago	12		38
Do	Calro	16·5	Calro	10	1873	Rock Island Arsenal	14		11
Indiana	Indianapolis	3·2	Indianapolis	2	1873	Spiceland	0		14
Indian Territory	Fort Reno	21·6	Fort Gibson	7	1876	Fort Gibson	7		48
Do	Fort Sill	25·5	Fort Sill	10	1886	Camp Supply	2	1876	2
Iowa	Dubuque	1·1	Dubuque	10	1875	Muscataine	10		27
Do	Keokuk	8·6	Keokuk	10	1873	Algona	25		10
Kansas	Leavenworth	15·0	Leavenworth	2	1876	Fort Leavenworth	9		52
Do	Dodge City	13·4	Dodge City	3	1880	Fort Riley	20		21
Kentucky	Louisville	12·3	Louisville	3	1873	Newport Barracks	3		29
Louisiana	Shreveport	31·0	Shreveport	20	1876	Baton Rouge	20		58
Do	New Orleans	36·0	New Orleans	30·5	1876	New Orleans	29		51
Maine	Eastport	5·2	Eastport	4	1873	Gardiner	20		43
Do	Portland	1·1	Portland	0·5	1883	Portland	13		37
Maryland	Baltimore	11·8	Baltimore	5	1873	Fort McHenry	0		53
Massachusetts	Boston	2·9	Boston	1·5	1875	Williamstown	12		63
Do	Alpena	15·7	Alpena	19	1875	New Bedford	0		58
Michigan	Escanaba	24·7	Escanaba	26·8	1884	Fort Brady	32	1875	60
Do	Saint Paul	5·8	Saint Paul	22·5	1884	Fort Mackinac	19		35
Minnesota	Moorhead	15·5	Breckenridge	32	1873	Fort Snelling	24		63
Do	Vicksburg	27·0	Vicksburg	27	1876	Fort Ripley	37		18
Mississippi	Saint Louis	13·1	Saint Louis	8	1876	Vicksburg	25		4
Missouri	Fort Custer	6·5	Fort Custer	23	1873, 1876	Saint Louis	6		39
Do	Fort Benton	17·5	Fort Benton	42	1880	Fort Ellis	36		14
Nebraska	Omaha	9·1	Omaha	7	1876	Fort Benton	42	1876	12
Do	North Platte	9·6	North Platte	21	1880	Glendale	20		2
Nevada	Winnemucca	19·2	Winnemucca	3	1882	Bellevue	15		11
New Hampshire	Mount Washington	47·8	Mount Washington	34	1883	Camp Halleck	8	1880	12
New Jersey	Sandy Hook	7·4	Sandy Hook	0·9	1884	Dartmouth College	23		18
Do	Cape May	10·8	Cape May	9	1873	Paterson	0		9
New Mexico	Santa Fe	22·0	Santa Fe	0	1880	Newark	2		32
Do	Lava	21·0	La Mesilla	19	1881, 1882	Fort Union	12	1880, 1882	25
New York	Albany	5·5	Albany	4	1875	Santa Fe	8		55
Do	Oswego	9·6	Oswego	2·5	1875	Madison Barracks	36		57
North Carolina	Wilmington	26·2	Wilmington	20	1873	Fort Johnson	14		58
Do	Fort Macon	24·2	Fort Macon	25·6	1884	Fort Macon	25		16
Ohio	Cincinnati	6·2	Cincinnati	1	1873	Cincinnati	4		36
Do	Cleveland	4·4	Cleveland	2	1873	Marietta	10		53
Oregon	Portland	33·0	Portland	25·5	1880	Camp Harney	3		6
Do	Roseburg	29·3	Roseburg	19	1880	Astoria	19		20
Pennsylvania	Philadelphia	6·5	Philadelphia	6	1873	Philadelphia	5		113
Do	Pittsburg	4·9	Pittsburg	2	1873, 1877	Allegheny Arsenal	4		32
Rhode Island	Block Island	8·6	Newport	8·9	1883	Fort Adams	6		44
Do	Point Judith	5·0	New Shoreham	10	1883, 1884	Providence	4		35
South Carolina	Charleston	33·5	Charleston	25	1873	Charleston	31		105
Do	Knoxville	17·3	Knoxville	6	1873	Fort Moultrie	25		38
Tennessee	Memphis	26·2	Memphis	18	1876	Humboldt	5?	1876	11
Do	Galveston	43·2	Galveston	34	1875	Glenwood Cottage	11		11
Texas	Fort Elliott	18·0	Fort Elliott	2	1880	San Antonio	29		28
Utah	Salt Lake City	24·3	Salt Lake City	4	1874	Fort Davis	9		23
Vermont	Burlington		Burlington	4	1873	Fort Douglas	0		12
Virginia	Norfolk	20·0	Norfolk	15·5	1873	Randolph	27		5
Do	Lynchburg	17·4	Lynchburg	6	1873	Fortress Monroe	13		58
Washington Territory	Olympia	30·0	Olympia	23	1880	Alexandria	16		12
Do	Dayton	28·8	Dayton	8	1880	Fort Colville	20		20
West Virginia	Morgantown		Morgantown	0·5	1873	Weston	2	1876	3
Wisconsin	Milwaukee	4·3	Milwaukee	8·5	1884	Milwaukee	7		11
Do	La Crosse	2·0	La Crosse	23	1873	Fort Crawford	23		26
Wyoming	Cheyenne	3·7	Cheyenne	17	1880	Fort Bridger	29		20

Palermo, Oswego county: mean temperature,  $17^{\circ}.1$ , is  $10^{\circ}.6$  below the March average for the last thirty-two years, and is the lowest for that period.

Cooperstown, Otsego county: mean temperature,  $18^{\circ}.3$ , is the lowest recorded in March since 1850, and is  $10^{\circ}.2$  below the average for thirty-five years; the next lowest mean ( $19^{\circ}.5$ ) was that for 1872.

Ohio.—Cleveland: mean temperature,  $25^{\circ}.6$ , is the lowest recorded in thirty years with the exception of that for 1856, which was  $0^{\circ}.7$  lower.

Wauseon, Fulton county: mean temperature,  $24^{\circ}.5$ , is  $8^{\circ}.3$  below the March average for the last fifteen years.

Pennsylvania.—Dyberry, Wayne county: mean temperature,  $19^{\circ}.5$ , is  $9^{\circ}.4$  below the March average for the last twenty years.

Wellsboro, Tioga county: mean temperature,  $22^{\circ}.4$ , is the coldest by  $4^{\circ}.5$  that has occurred during the last thirty years.

Quakertown, Bucks county: mean temperature,  $26^{\circ}.4$ , is  $9^{\circ}.6$  below the March average for the last nine years.

Wilkes Barre: mean temperature,  $25^{\circ}.6$ , is  $8^{\circ}.6$  below the March average for the last fifteen years.

Rhode Island.—Providence: mean temperature,  $26^{\circ}.4$ , is  $7^{\circ}$  below the March average for the last fifty-one years.

Texas.—New Ulm, Austin county: mean temperature,  $58^{\circ}.0$ , is the lowest recorded in March during the last thirteen years, and is  $5^{\circ}.2$  below the average for the same period.

Vermont.—Burlington: mean temperature,  $19^{\circ}.3$ , is the lowest recorded in March for many years.

Woodstock, Windsor county: mean temperature,  $17^{\circ}.8$ , is  $7^{\circ}.4$  below the March average for the last eighteen years. The highest March mean in that period,  $33^{\circ}.3$ , occurred in 1871: the lowest,  $16^{\circ}.8$ , occurred in 1872.

Virginia.—Wytheville, Wythe county: mean temperature,  $37^{\circ}.0$ , is  $5^{\circ}.6$  below the March average for a period of twenty years.

Variety Mills, Nelson county: mean temperature,  $37^{\circ}.1$ , is  $7^{\circ}.9$  below the March average for the last eight years, and is the lowest for that period.

Bird's Nest, Northampton county: mean temperature,  $40^{\circ}.1$ , is, with the exception of that for March, 1872 ( $37^{\circ}.6$ ), the lowest recorded during the last sixteen years.

West Virginia.—Helvetia, Randolph county: mean temperature,  $32^{\circ}.6$ , is  $7^{\circ}.6$  below the March average for the last nine years.

#### FROSTS.

The dates on which frost occurred during March in the various districts are as follows:

New England.—1st to 31st.

Middle Atlantic states.—1st to 31st.

South Atlantic states.—2d, 3d, 6th to 10th, 14th, 16th to 26th, 29th, 30th, 31st.

Florida peninsula.—Sanford and Mayport, 10th; Newport, 9th, 10th, 11th, 17th, 24th.

East Gulf states.—2d, 3d, 4th, 6th to 11th, 14th, 16th, 17th, 19th to 24th, 29th, 30th.

West Gulf states.—1st, 2d, 3d, 5th, 6th, 7th, 9th, 10th, 15th, 16th, 18th, 20th, 22d, 23d, 29th.

Tennessee.—2d, 3d, 6th to 11th, 14th to 26th, 29th, 30th.

Ohio valley.—Daily, except 12th.

Lower lake region.—Daily, except 1st, 27th, and 31st.

Upper lake region.—1st to 31st.

Extreme northwest.—1st to 31st.

Upper Mississippi valley.—1st to 31st.

Missouri valley.—1st to 31st.

Northern slope.—Daily, except 16th, 23d, and 26th.

Middle slope.—Daily, except 29th.

Southern slope.—Fort Davis, Texas, 2d; Fort Concho, Texas, 2d, 22d, 29th.

Southern plateau.—1st to 10th, 12th to 16th, 18th, 22d, 26th to 29th, 31st.

Middle plateau.—Daily, except 18th.

Northern plateau.—1st to 9th, 12th to 21st, 23d, 24th, 25th, 27th, 28th.

North Pacific coast region.—1st to 4th, 6th, 7th, 8th, 12th, 16th, 17th, 18th, 22d to 31st.

Middle Pacific coast region.—Sacramento, 1st, 3d, 11th, 14th; Princeton, 1st, 2d, 24th; Oakland, 3d; San Rafael, 1st, 2d.

#### ICE.

Ice formed in the southern parts of the country as follows: Arkansas.—Lead Hill, 2d, 7th, 8th, 9th, 16th, 17th, 18th, 20th to 23d, 29th.

Florida.—Pensacola, 23d.

Georgia.—Augusta, 24th; Athens, 8th, 9th, 10th, 20th, 22d, 23th, 24th.

#### PRECIPITATION.

[Expressed in inches and hundredths.]

The distribution of rainfall over the United States and Canada, for the month of March, 1885, as determined from reports from more than seven hundred stations, is exhibited on chart iii.

In the following table are shown, for each of the geographical districts, as deduced from Signal Service observations, the average March precipitation for a series of years; the average for March, 1885, and the departures from the normal.

Average precipitation for March, 1885.

Districts.	Average for March Signal-Service ob- servations.		Comparison of March, 1885, with the av- erage for sev- eral years.
	For sev- eral years.	For 1885.	
	Inches.	Inches	Inches.
New England.....	4.52	1.84	-2.68
Middle Atlantic states.....	4.45	1.44	-3.01
South Atlantic states.....	5.37	1.05	-4.32
Florida peninsula.....	2.34	3.31	+0.97
Eastern Gulf states.....	6.56	4.13	-2.43
Western Gulf states.....	4.01	3.06	-0.95
Rio Grande valley.....	1.17	0.98	-0.19
Tennessee.....	6.14	2.57	-3.57
Ohio valley.....	3.88	0.86	-3.02
Lower lake region.....	2.98	0.96	-2.02
Upper lake region.....	2.25	1.38	-0.87
Extreme northwest.....	1.17	0.35	-0.82
Upper Mississippi valley.....	2.53	0.39	-2.14
Missouri valley.....	1.48	0.23	-1.25
Northern slope.....	0.81	0.70	-0.11
Middle slope.....	0.61	0.86	+0.25
Southern slope.....	0.87	3.04	+2.17
Southern plateau.....	1.03	1.06	+0.03
Middle plateau.....	1.48	0.42	-1.06
Northern plateau.....	1.44	0.33	-1.11
North Pacific coast region.....	5.45	0.47	-4.98
Middle Pacific coast region.....	3.54	0.36	-3.18
South Pacific coast region.....	1.69	0.27	-1.42
Mount Washington, N. H.....	6.75	0.95	-5.80
Pike's Peak, Colo.....	1.98	0.88	-1.10

From the above table it will be seen that the precipitation for March, 1885, has been below the average in nearly all districts. Over an area extending from the lower Rio Grande valley northwestward to eastern Arizona, and at a few isolated stations, (principally along the Gulf coast and in the northern part of the upper lake region) the precipitation has been above the average. At Jacksonville, Florida, and San Antonio, Texas, the excess exceeded 2.00, and at Fort Stockton, Texas, it was more than 7.00. The large excess at the station last named was due to the exceptionally heavy rains on the 14th and 15th, when 6.25 fell. At Jacksonville, Florida, the precipitation for the month was nearly double the average. At other stations where the precipitation was excessive, the departures were small. As in the preceding month the most marked feature in connection with the precipitation was the extensive area of deficiency, which included all of the country with the exceptions named above. In all districts east of the Mississippi river, (except Florida and the upper lake region), and also in the north and middle Pacific coast regions the deficiencies averaged above 2.00. In the districts where the largest deficiencies occurred the monthly precipitation as compared with the average was as follows: New England, less than one-half; Tennessee, lower lake region, extreme north-west and middle Atlantic states, about one-third; south At-